

SECRETORY OTITIS MEDIA*

With Classification Based On Amenability To Therapy

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CERTAINLY no subject in otolaryngology has attracted more attention within the last 6 to 7 years than a symptom complex known by various names—but more particularly as secretory otitis media or otitis media with effusion. At the A. M. A. meeting in Atlantic City, I presented an exhibit of ear drum photographs, among which were a series of secretory otitis cases. The ENT men that saw the exhibit were particularly interested in this series, and without exception stopped to discuss the therapy; many of them admitting that some of these cases were extremely baffling. This problem is plaguing us all. There is no question in my mind that the disease complex is much more commonly seen than previously. At the same time, the increased interest in this disease has resulted in many cases being diagnosed that were hitherto missed. My own interest in serous otitis dates back to my army career, where in a basic training center for air crew personnel, I examined the ears of great numbers of soldiers, and picked up about 100 cases of fluid in the middle ear; of which I reported results of studies of seventy-six cases.¹ Since then, many investigators have searched diligently for the answer to a disease that Gordon Hoople² so aptly calls “A Challenge to Otolaryngology.”

In consideration of etiology, it has up to recently been generally conceded (and still is—by many investigators) that the basic pathologic cause of secretory otitis media is the blocked eustachian tube with the formation of either a transudate due to osmotic action of negative pressure acting on blood vessels of the tympanic cavity—or an exudate produced by a hypovirulent infection.

However, it is becoming more apparent that other factors independent of eustachian tube closure may play an important role in the

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formation of these effusions, and it is probable that in this etiologic realm we encounter the real problem of the recurrent secretory ear with the re-formation of fluid constantly or intermittently. It is in this latter classification that I am intrigued by Hilger's³ conception of autonomic nervous system imbalance due to emotional stimuli or physical allergy (Williams'⁴ so-called "pathergy") playing a part in certain forms of this condition so that we may be actually dealing with a vasomotor otitis media with a marked, continued, actively leaking mucous membrane involving the entire middle ear cavity including the mastoid and eustachian tube.

Allergic states have lately been considered an important culprit in the etiology of these cases—with extremes of opinion. Tobey⁵ states that although the possibility of allergy as a cause of effusion has been constantly kept in mind in no instance has it proved to be an etiologic factor. Contrast this to Jordan's⁶ consideration that out of one hundred and twenty-three patients, ninety-one or 74 per cent were definitely allergic.

Day⁷ is convinced that in children most of the cases are allergic, especially to milk and orange juice. Only recently has it become recognized that secretory otitis media is an important problem in children, particularly because of its causation of deafness in childhood, reversible at this early age, but possibly the beginning of some of the irreversible adult hearing states.

The problem is particularly accentuated in that the child, of course, offers no complaints, as he is only presented to us by an observant teacher or parent, who suspects hearing loss in the child. It is alarming to consider how many of these cases never even reach the care of the general physician, much less the otologist. It is in this connection that we otologists have an important duty, i.e., to hammer incessantly at the general physician and the pediatrician, that, following an acute ear infection—however mild, even though normal temperature, relief of pain and alleviated parent anxiety seem to indicate resolution of the ear, the patient cannot be discharged until one of the cardinal signs of inflammation—"loss of function"—in this case the hearing, has returned to normal.

It is in this connection also that we may consider what may well be a prime etiologic factor. Are we modifying the virulence of ear infections with the antibiotics, so that instead of a purulent exudate, an

avirulent or hypovirulent infection causes a serous exudate? Has the use of antibiotics in general, bred an obtunded or attenuated series of organisms which, for the time being, is only capable of mildly insulting the tympanic mucous membrane? If we accept this hypothesis, we must believe with Tobey⁵ that serous exudation and suppurative otitis media be considered sequential stages of the same process.

In children then, we must constantly be on guard to recognize symptoms of both the acute and the chronically obstructed eustachian tube with effusions in the middle ear. Lindsay and Perlman⁸ have particularly emphasized the importance of diagnosis of the chronically obstructed eustachian tube.

The presence of hypertrophied adenoids or obstructive lymphoid remnants is certainly a positive indication for surgery when there is persistent serous otitis. I often aspirate both ears while doing a T & A and remove the fluid from the middle ear. Day⁷ states that when he opens a serous or mucous ear in a child he always goes into the nasopharynx with his fingers to break up adhesions around the eustachian tube. As an aside, but very appropriate at this point, is my plea that we otolaryngologists learn to do an unhurried, more complete adenoidectomy, removing not only the posterior masses of adenoids, but also the many other masses of lymphoid tissue which are not touched by the standard adenoidectomy—particularly the infiltrated hyperplastic salpingo-palatine folds so often encountered (Furlong⁹).

The relationship between secretory otitis media and aero-otitis media has impressed many investigators, and as early as 1943 I attempted to draw an analogy between the two states. In both conditions, the drum head is retracted, the eustachian tube obstructed and fluid is present. It is my feeling that acute aero-otitis media can be considered as a sudden hyperacute secretory otitis by which the pathologic changes are caused by increased atmospheric pressure of descent acting on the eustachian tube in such a way as to literally "tear out" fluid, either serous fluid, serosanguinous fluid or actual blood from the blood vessels of the closed off tympanic cavity by intense negative pressure. In secretory otitis, the process is more gradual, with obstruction of the eustachian tube by mild inflammation and edema causing serous or mucoid secretion. In many cases, when aero-otitis does not resolve it may blend into what we recognize then as secretory otitis media.

Trauma may play a part in certain cases, for on several occasions I

have seen fluid formation following a blow across the ear.

The influence of the weather may be an important etiologic factor. In my Army cases, I noted that on the Gulf Coast where the military installation was located, we had an average of 10-20 per cent higher humidity than in the interior of the country.

SYMPTOMATOLOGY

In the majority of cases, the symptom complex follows a fairly consistent pattern. The patient has, or recently has had, a nasal cold, sore throat, or some upper respiratory infection, or has been on a plane ride. One or both ears feel stuffy or blocked, and he generally complains bitterly of impaired hearing in the involved ear. Some of the terms used by patients to describe their feelings are: "ears feel dead or lifeless," "like a piece of wood," "stuffy," "blocked or hearing lopsided in that ear," or "feel something rolling in the ear like water," "feels like I am speaking through that ear." Tinnitus of various types may be complained of; and occasionally vertigo is present.

If only a small amount of fluid is present, hearing may be little or not at all affected. However, in most cases, deafness is markedly distressing and is the presenting symptom. It is this symptom of deafness which seems out of proportion to the length of time of symptoms, and to the apparent pathologic change that should lead one to suspect the diagnosis. Hearing loss as measured by the whispered voice, using 15/15 as normal may fall to as low as 1/15 or less, although usually the loss is about 6/15. When measured by the audiometer under ordinary clinic conditions, an average of 30 decibels of loss is found if the ear contains a great deal of fluid.

The symptom of otic blockage may be present for periods varying from one day to six months to even several years. In the majority of patients, symptoms are present for periods of from two days to two weeks although complaints of six to ten weeks duration are fairly common. If pain has been present, it is my experience that it takes 48-72 hours for the fluid to form after the initial pain experience. In cases of long duration, the symptoms are sometimes intermittent and the blocked feeling may disappear for short periods. Sometimes this feeling of relief may be present at various times of the day. One patient had this blockage and deafness for two years with only short intervals of relief.

I wish to re-emphasize the importance of the symptoms of deaf-

ness and blockage in the diagnosis of this infection. In many instances in which the patient complained of annoying deafness, I have not been able to discover fluid at first, even though strongly suspecting its presence. Invariably, however, after observing the drum head for a few days, I have been able to demonstrate its presence. In reiteration, if deafness seems out of proportion to the apparent pathologic change—fluid should be assiduously sought, and invariably will be found; particularly is this true if the patient can date the onset of his deafness to a definite time, say within six months.

Pain, in general, is not a marked feature of secretory otitis, and when it is present, is comparatively mild and rarely lasts more than 6-8 hours. These pain cases may represent the common acute catarrhal otitis media in an early phase, resulting in a secretory form at a later stage, possibly representing, as stated before, sequences of the same disease.

A more interesting phenomenon of otitis media with effusion is the length of time—up to many months, or even several years—that the secretion can remain in the middle ear with apparently no change. However, it is inevitable that if the secretion be allowed to remain indefinitely, the disease will go on to permanent intratympanic changes with permanent decrease in hearing acuity.

Where the mucoid secretion comes from is puzzling, as the only mucoid glands of the middle ear are present near the mouth of the eustachian tube.

Appearance of Drum Head: The appearance of the tympanic membrane is usually one of retraction; and depends on the amount of air and secretion present in the tympanic cavity at the time of examination. The fluid, if seen through a transparent tympanic membrane is tan colored or brownish pink and if the promontory is visible, a canary yellow tinge is imparted to the fluid in that area. Because of the retraction, the upper level of the contained fluid is seen as a meniscus, single if below the level of the umbo and segmented if above. If the drum head is more translucent, the fluid level is seen as a dark line, and if more opaque no fluid level may be seen at all. After seeing a sufficient number of these cases a sixth sense sometimes tells that fluid is present. In all cases comparison of the two tympanic membranes must be done and differences noted. The cases which most often are missed, are the ones in which fluid fills the entire ear cavity. Here the

change in color as compared with the other ear may help in diagnosis, or introduction of air through the eustachian tube may make the fluid more evident and on auscultation, during catheterization, the characteristic bubbling sound of air entering a fluid mass may be heard. Hotchkiss¹⁰ and Hoople² have discussed very carefully the characteristic auscultation sounds heard during inflation. Many times it may be necessary to do a diagnostic aspiration to firmly establish the diagnosis.

TREATMENT

In all cases, it is necessary to treat the underlying nasopharyngeal condition. Any acute process in the nose, sinuses or nasopharynx should be treated with antibiotics, and the other usual methods of local therapy, including shrinkage of the mucosa of the nose, eustachian tube and careful canula suction of secretion in the nose and nasopharynx.

In order to clarify the concept of therapy in these cases with effusion, I have attempted to classify them according to their amenability to therapy.

1. *Acute Secretory Otitis Media, Mild:* a. Cases in which spontaneous resolution occurs with general treatment of the upper respiratory infection or other pathology plus hygiene of the nasopharynx.

b. Those cases that resolve following one or two inflations, by catheterization or by politzerization. These are usually secondary to upper respiratory infections, colds, acute tonsillitis and adenoiditis, mild aero-otitis, trauma, allergy. They most often present a serous secretion.

2. *Subacute Secretory Otitis Media:* a. These include the untreated or unrecognized cases.

b. Unresolved cases following inflations and simple therapy. These represent a great majority of the cases of effusion that we see. Treatment consists of aspiration or paracentesis of the tympanic cavity combined with politzerization, catheterization or suction.

I usually do an aspiration first either for therapy or if necessary for diagnosis. I use a tuberculin syringe with a #22 $1\frac{3}{4}$ in. long needle. All debris and cerumen are carefully cleaned from the canal which is then painted with Tr. Merthiolate. With the patient in the sitting position, I point the needle just posteriorly to 6 o'clock on the drum head. The needle is plunged sharply through the tympanic membrane and the plunger pulled out until resistance is met showing that all fluid has been withdrawn. If one or two aspirations do not result in resolu-

tion, I then do a paracentesis of the tympanic membrane followed by inflation to drive out the contained secretion. A sweeping incision need not be made; one just slightly longer than a stab is sufficient at the usual myringotomy site. This should be followed in all cases by either spot suction at the point of incision or suction through a Siegel speculum combined with inflation of the eustachian tube through a catheter. I have found inflation perfectly satisfactory. All catheterizations should be carefully done to avoid trauma, and I usually inflate under direct visualization of the catheter movement through a nasopharyngoscope. If catheterization is inconvenient or not borne well, politizerization works almost as well. There is seldom any bleeding at the incision point, and healing occurs quickly—too quickly at times; the myringotomy wound being glued together by fibrin within 48 hours. Incidentally, it is interesting to watch the migration of the crust which forms on the drum head as a result of the aspiration. Invariably within two weeks it is seen on the canal wall.

Anesthesia is not a problem. It has been commonly noted that the uninflamed tympanic membrane can be incised without anesthesia with only slight discomfort to the patient, and many drum heads have been incised in this manner.

The results of aspiration or paracentesis and inflation are usually remarkable and even startling. The patient exclaims immediately afterwards that he hears well, and on testing the hearing, it is found to be normal or definitely improved.

The fluid from the middle ear, which collects in the canal after myringotomy—and the various methods of expelling the fluid—is removed by cotton wipes. The volume of fluid present may vary from 5-20 drops. In some cases it is clear yellow and serous in consistency—in others especially if of longer duration, it is thick and mucoid; at times so much so that it hangs like long strings. Occasionally, there may be so much fluid present that a pulsating serous discharge may be seen coming through the opening which may persist for twenty-four hours or longer. It is most likely that in these cases the fluid filled the mastoid cells as well as the middle ear.

One or two or even more catheter inflations are usually necessary for complete relief or restoration of aeration of the middle ear, although in many cases—myringotomy and one inflation are sufficient to completely relieve the symptoms. In others, several myringotomies may be neces-

sary and if the original incision is closed, which is usually the case, a new one is made without hesitancy.

3. *Recurrent Secretory Otitis Media*: a. The mild forms may recur very frequently but each recurrence is easily handled by aspiration or myringotomy followed by inflation; these may be serous or mucoid in type.

b. The moderately severe type—each recurrence of which is exceedingly difficult to control but within a reasonable time the condition is brought under control with repeated myringotomies. Some cases with recurrences are very complex. I have had many cases in which I have done up to twenty aspirations or myringotomies. Westley Hunt¹¹ speaks of a 69 year old physician on whom he has done eighty-three myringotomies within a six year period. This type is but a step removed from

c. The continuous and severe type which, at the risk of being accused of levity, I would term the “open spigot” or even the malignant type, in which the fluid re-forms quickly and continuously in amounts sometimes beyond comprehension. Here we have the most aggravating and puzzling form of this disease—one that taxes our every skill and patience, resisting our every therapeutic measure.

This is the form which no doubt corresponds to Jervey's¹² “Mastoiditis hyperplastica serosa” case, where the fluid is found in all the components of the middle ear—and where, in sheer desperation we do mastoidectomies, sometimes without avail. These recurrent types are where we start searching for other systemic diseases, the thyroid and other endocrine dysfunctions, the dental malocclusions, the allergies, and the autonomic imbalances that we spoke of. We have not yet found a uniform satisfactory answer to this form of the disease. If we follow the reasoning of Hilger³—as to the autonomic nervous system, the use of such substances as: Banthine, hexamethonium, nicotinic acid, intravenous histamine, and procaine may offer a measure of therapeutic success. This is the type in which we would like to find a good method of getting a permanent fistulous opening in the tympanic membrane, so that fluid drainage can be continuous. Some men have been using very small punch forceps. Hotchkiss¹⁰ has adopted the ophthalmologist's corneal trephine, mounted in a long handle, using the 2 and the 2.5 mm. sizes. With this instrument he makes an opening in the posterior quadrant of the drum head, with some fairly successful results.

SUMMARY

The symptom complex of secretory otitis media, with the presence of an effusion in the tympanic cavity, has created much interest among otologists—both because an increased awareness of this condition has resulted in more frequent diagnoses, and also that there has been seemingly a marked increase in the incidence of this disease. There is a possibility that the increase of virus infections, and the attenuating effects of the antibiotics, may be factors involved in the more frequent formation of serous or mucous secretions within the middle ear. The process must be assiduously searched for in children, for here is a golden opportunity for reversing pathology before permanent changes render the processes irreversible, with permanent hearing damage.

A classification of the disease according to its amenability to therapy into acute, subacute, and recurrent types, is offered, in which consideration is given to the various modes of therapy. These range from expectant treatment in the hope of spontaneous resolution, combined with inflations, to removal of the contained secretion by aspiration or myringotomy. The troublesome aspect of some of these cases is due to the tendency in many instances for frequent recurrences to appear, sometimes so severe that we can do little to control them. It is these recurrent types, so puzzling in their nature, that make this disease so bothersome to handle. We have as yet found no uniform satisfactory answer to this form of the disease—besides trying to create a permanent fistula, a difficult and unsatisfactory procedure at best.

Treatment of local pathology that might cause chronic obstruction of the eustachian tube, is obviously an important step. The upper half lymphoid elements of Waldeyer's ring must be removed if obstructive, either by surgery, radium, or x-ray therapy. Systemic causes as endocrine disturbances or specific allergies must be investigated and treated. Hilger has offered the extremely interesting speculation that an autonomic nervous system dysfunction may cause what may be considered a vasomotor otitis media, and based on this theoretical consideration—drugs influencing the autonomic nervous system as Banthine, nicotinic acid, and intravenous histamine, and procaine—may offer a solution to this difficult problem.

Further study of secretory otitis media is necessary, for there are many unsolved aspects of this problem. It is apparent that a more

thorough understanding of the mechanism of this interesting disease, will materially aid in the solution of that old but important problem—chronic middle ear deafness.

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